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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/795,827	Applicant(s) FENSTER ET AL.
	Examiner Frederick F. Rosenberger	Art Unit 2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 19 July 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 46-96 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 46-96 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 July 2004 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's preliminary amendment, filed 19 July 2004, has been received and entered. Accordingly, claims 1-45 have been cancelled. Claims 46-96 have been added. Thus, claims 46-96 are currently pending in this application.

Information Disclosure Statement

2. Applicant is advised that no Information Disclosure Sheet was received with this application.

Drawings

3. The drawings were received on 19 July 2004. These drawings are not acceptable. See objections below.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "**136**" has been used to designate both the detector and the rack in Figure 1.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **130** (page 3, line 3 of paragraph 10).

6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities:

In the abstract, line 2, both instances of "at least one" should be --at least two--, in accordance with applicant's claims and disclosure.

On page 2, line 3 of paragraph 9, "a 104" should probably be --a body 104--.

Appropriate correction is required.

Claim Objections

8. Applicant is advised that should claim 87 be found allowable, claim 89 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both

cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

9. Claims 50, 53, 54, 64, 65, 79-82, and 90 are objected to because of the following informalities:

In claim 50, the comma at the end of the claim should be replaced with a period.

In claim 53, line 4, "the rotation" should be --a rotation-- for proper antecedent basis.

In claim 54, line 2, "the motor" should be --the electrical motor-- for proper antecedent basis.

In claim 64, line 2, "said rotating a detector transport member" lacks proper antecedent basis in claim 62. Only the step of translating a detector transport member has been discussed in claim 62.

In claim 65, line 2, the same objection with regards to claim 64 applies.

In claim 79, line 2, "said arcuate base" lacks proper antecedent basis in claim 78. Only a base has been discussed in claims 66 and 78.

In claim 80, line 2, the same objection with regards to claim 79 applies.

In claim 81, lines 2 and 3, both instances of "said arcuate base" lack proper antecedent basis in claim 66. Only a base has been discussed in claim 66.

In claim 82, line 2, the same objection with regards to claim 81 applies.

In claim 90, line 2, "all said detectors" should be --all of said at least two detectors-- for proper antecedent basis in claim 66.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 46-50, 58, 62, 63, 66-68, 83, and 87-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange (US Patent # 6,180,943).

With regards to claim 46, Lange discloses a method of imaging a patient, the method comprising:

Coupling two nuclear medicine detectors **1**, **2** (Figure 1) to a detector transport member, in the form of common support **3**, wherein the two detectors move with the detector transport member **3**, the detector transport member **3** spanning an arc of about 180° about the examination axis **4** (Figure 2);

Supporting the detector transport member **3** with a base **6** having a support assembly **32** for receiving and connecting to the detector transport member **3**; and

Rotating the detector transport member **3** about the examination axis **4** to a plurality of imaging positions (abstract).

Lange discloses a detector transport member, in the form of support **3**, which spans an arc of about 180° about the examination axis **4**. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a

claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 47, Lange discloses a pair of nuclear medicine detectors for detection of a radioactive marker (claim 12) coupled together such that a detecting face of a first detector **1** is substantially perpendicular to the detecting face of a second detector **2** (Figures 1 and 2).

With regards to claim 48, Lange discloses the edge of the first detector **1** proximate the edge of the second detector **2** (Figure 1).

With regards to claim 49, Lange discloses that the detectors are oriented such that the normal of the face of the two detectors are oriented orthogonal to the examination axis **4** (Figures 1, 2, and 5).

With regards to claim 50, Lange discloses that the patient is positioned on the top surface **5** of the bed and moved through the opening in the support assembly **32** and the gap in the detector transport member **3** (Figures 1 and 5).

With regards to claim 58, Lange discloses that the detectors are used in gamma ray emission detection, i.e. SPECT imaging (column 1, lines 44-45; claim 12).

With regards to claim 62, Lange discloses a method for medical imaging, the method comprising the steps of:

Rotating a detector transport member, in the form of common support **3**, around an arc, thus translating the detector transport member in an arcuate path, about the examination axis **4**, wherein the detector transport member spans an

arc of about 180° (Figure 2) and two detectors **1**, **2** coupled to the detector transport member **3**;

Supporting the detector transport member **3** with a ring-shaped support member **32** as part of base **6**, wherein the ring-shaped support member **32** can take the form of an arcuate C-shaped member (column 7, lines 40-44), wherein the base remains stationary with respect o the examination axis.

Lange discloses a detector transport member, in the form of support **3**, which spans an arc of about 180° about the examination axis **4**. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 63, Lange discloses that the a pair of nuclear medicine detectors are coupled to the detector transport member such that the detecting face of the first detector is perpendicular to the detecting face of the second detector (claim 12; Figure 1).

With regards to claim 66, Lange discloses an imaging system comprising:

An arcuate detector transport member, in the form of C-shaped common support **3** (Figure 1), that extends approximately 180° circumferentially about an examination axis **4** (Figure 2);

A base **6** comprising a support assembly, in the form of ring **32** (Figure 2), for receiving and connecting to the detector transport assembly **3**, wherein said base is configured to translate the detector transport member in an arcuate path about the examination axis to a plurality of imaging positions via the ring **32**; and,

Two detectors **1**, **2** (Figure 1) coupled to the detector transport member **3**.

Lange discloses a detector transport member, in the form of support **3**, which spans an arc of about 180° about the examination axis **4**. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 67, Lange discloses that the support assembly, in the form of ring **32**, can be C-shaped, or arcuate, instead of a circle (column 7, lines 41-44).

With regards to claim 68, Lange discloses that the detector support member is movable along an arc defined by the ring **32**, which is an integral part of the base **6** (column 3, lines 55-57).

With regards to claim 83, Lange discloses that the two detectors are fixedly coupled to the detector transport member (column 3, lines 35-38; claim 11);

With regards to claims 87 and 89, Lange discloses that the two detectors are configured to receive emission gamma rays at a plurality of imaging positions (claim 12; column 1, lines 49-55), wherein said emission gamma rays are emitted from an imaging volume proximate the examination axis (Figure 5).

With regards to claim 88, Lange discloses a pair of nuclear medicine detectors for detection of a radioactive marker (claim 12) coupled together such that a detecting face of a first detector **1** is substantially perpendicular to the detecting face of a second detector **2** (Figures 1 and 2).

With regards to claim 90, Lange illustrates that the two detectors **1**, **2** are at separate and distinct locations on the detector transport member **3** (Figure 1).

With regards to claim 91, Lange discloses a medical imaging apparatus comprising:

A ring-shaped support assembly **32**, capable of being formed as a C-shaped or arcuate support (column 7, lines 40-44);

A detector transport member, in the form of common support **3**, movably coupled to said support assembly **32**, the detector transport member spanning an arc of about 180° about an examination axis **4**; and,

Two detectors **1**, **2** fixedly coupled to the detector transport member **3** (column 3, lines 35-38; claim 11).

Lange discloses a detector transport member, in the form of support **3**, which spans an arc of about 180° about the examination axis **4**. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 92, Lange discloses that the support assembly **32** can take the form of a C-shaped support (column 7, lines 40-44).

With regards to claim 93, Lange discloses that the detector transport member is generally arcuate shaped (Figure 2).

With regards to claim 94, Lange discloses that the support assembly **32** is coupled to the base **6**, the base comprising a power transmission member, in the form of drive chain **34** and drive sprockets **36**, **37** (Figure 2; column 4, lines 31-43) for moving the detector transport member **3** via the support member **32**.

With regards to claim 95, Lange discloses that a motor **35** is in the base **6** for driving the sprockets and thus the drive chain (Figure 2; column 4, lines 31-43).

With regards to claim 96, although Lange do not specifically disclose that the power source for the motor **35** is within the base, it would have been obvious to one having ordinary skill in the art at the time the invention was made to integrate the power source in the base with the motor, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

13. Claims 55-57 and 78-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange, as applied to claims 46 and 66 above, and further in view of Maor (US Patent # 6,160,258).

With regards to claims 55-57, Lange discloses all the limitations of parent claim 46, as discussed above. With regards to claims 78-80, Lange discloses all the limitations of parent claim 66, as discussed above.

However, Lange fails to explicitly disclose that the detector transport member is rotated less than about 180° while imaging the patient. Instead, Lange discloses that

the detector transport member is rotated about 180° while obtaining a SPECT image (claim 12). However, applicant only requires that the detector transport member be rotated less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include rotations slightly greater than 180°, such that the rotation of the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by Lange, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

14. Claims 64, 81, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange, as applied to claims 62 and 66 above, and further in view of Ashburn (US Patent # 6,147,352).

With regards to claim 64, Lange discloses all the limitations of parent claim 62, as discussed above, but fails to explicitly detail the rotation mechanism as intermittent or continuous.

However, Ashburn teaches that it is well known in the art to use either stepped or continuous rotation in SPECT imaging (column 2, lines 3-8). Ashburn further teaches that continuous rotation is desirable for reducing acquisition time (column 2, lines 8-10).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to continuously rotate the detector transport member, so as to reduce image acquisition time, as taught by Ashburn.

With regards to claims 81 and 82, Lange discloses all the limitations of parent claim 66, as discussed above. However, Lange does not explicitly detail if the detector transport member is held stationary relative to the base.

However, Ashburn teaches that in SPECT imaging it is common to use a step and shoot method, wherein during imaging the detectors are held in a single position for imaging and then rotated to the next imaging location (column 2, lines 3-8).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to maintain the detector transport member in a stationary position during imaging, since Ashburn teaches that such methods are well known in the art and that remaining stationary during imaging would help prevent image distortion.

15. Claims 59-61 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange and Ashburn, as applied to claim 64 above, and further in view of Maor (US Patent # 6,160,258).

With regards to claim 59, Lange discloses a method of imaging a patient, the method comprising the steps of:

> Aligning a patient with an examination axis **4** (Figure 5) by moving the patient on a top surface **5** through an opening in the support assembly **32** and through a gap in an arcuate detector transport member, in the form of common support **3** (Figure 2);
>
> Coupling a pair of nuclear medicine detectors for detection of a radioactive marker (claim 12) together such that a detecting face of a first detector **1** is substantially perpendicular to the detecting face of a second detector **2** (Figures 1 and 2);
>
> Rotating the detector assembly **3**, and thus the pair of detectors **1**, **2** about the examination axis **4** through an arc of about 180°; and,
>
> Supporting the detector transport member **3** with a base **6** having a support assembly **32** for receiving and connecting to the detector transport member **3**, wherein the base remains stationary with respect to the examination axis.

Lange discloses a detector transport member, in the form of support **3**, which spans an arc of about 180° about the examination axis **4**. However, applicant only requires that the detector transport member span an arc of less than about 180°, but

does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

In addition, Lange fails to explicitly disclose that the detector transport member, and thus the detectors, is rotated less than about 180°. Instead, Lange discloses that the detector transport member is rotated about 180° while obtaining a SPECT image (claim 12). However, applicant only requires that the detector transport member be rotated less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include rotations slightly greater than 180°, such that the rotation of the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by Lange, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are

capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

In addition, Lange does not explicitly disclose if the rotation is intermittent or continuous between the plurality of imaging positions.

However, Ashburn teaches that it is well known in the art to use either stepped or continuous rotation in SPECT imaging (column 2, lines 3-8). Ashburn further teaches that continuous rotation is desirable for reducing acquisition time (column 2, lines 8-10).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to continuously rotate the detector transport member, so as to reduce image acquisition time, as taught by Ashburn.

With regards to claim 60, Lange discloses the edge of the first detector **1** proximate the edge of the second detector **2** (Figure 1).

With regards to claim 61, Lange discloses that the support assembly, in the form of ring **32**, can be C-shaped, or arcuate, instead of a circle (column 7, lines 41-44).

With regards to claim 65, the combination of Lange and Ashburn disclose all the limitations of parent claim 64, as discussed above. However, Lange fails to explicitly disclose that the detector transport member, and thus the detectors, is rotated less than

about 180°. Instead, Lange discloses that the detector transport member is rotated about 180° while obtaining a SPECT image (claim 12). However, applicant only requires that the detector transport member be rotated less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include rotations slightly greater than 180°, such that the rotation of the detector transport member proposed by Lange would satisfy the claim limitation.

Further, it is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by Lange, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

16. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lange, as applied to claim 66 above, and further in view of Gullberg et al. (US Patent # 5,532,490).

Lange discloses all the limitations of parent claim 66, as discussed above. However, Lange is silent with regards to a tilting mechanism coupling the detectors to the detector transport member to modify the orientation of the two detectors with respect to the examination axis. Lange only teaches lateral motion for varying the distance of the detectors from the examination axis.

Gullberg et al. teach the use of a tilting mechanism to couple a detector to a transport member (column 3, lines 24-28). Gullberg et al. further teach that by using this tilting mechanism in combination with lateral motion, the field of the view of the detector can be optimized so as to prevent image truncation (column 1, lines 31-40; column 3, lines 19-31).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a tilting mechanism for coupling the detectors to the transport mechanism so as to allow customization of the field of view of the detector to prevent image truncation, as taught by Gullberg et al.

17. Claims 85 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange, as applied to claim 66 above, and further in view of DeVito et al. (US Patent # 6,242,743).

With regards to claims 85 and 86, Lange discloses all the limitations of parent claim 66, as discussed above, but is silent with regards to the detectors comprising pixilated CZT. Instead, Lange discusses the use of scintillators coupled with photodiodes for imaging the incident radiation.

DeVito et al. teach the use of pixilated CZT detectors in SPECT imaging. Specifically, DeVito et al. teach that pixilated CZT detectors are preferred because they combine the desirable traits of compact size, room-temperature operability, position sensitivity, good energy resolution, and good stopping power (column 6, lines 6-18).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use pixilated CZT detectors for the nuclear medicine detectors, so as to take advantage of their desirable performance characteristics, as taught by DeVito et al.

18. Claims 66-77, 81, 83, 84, and 91-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradcovick et al. (US Patent # 4,426,578).

With regards to claim 66, Bradcovich et al. disclose an imaging system comprising:

An arcuate detector transport member **30** (Figure 1) that extends at least 180° circumferentially about a rotation axis;

A base **10** comprising a support assembly **20** for receiving the detector transport member **30**, said base **10** configured to translate the detector transport

member **30** in an arcuate path about a rotation axis to at least one of a plurality of imaging positions; and,

Two detectors **50**, **50'** coupled to said detector transport member **30** (Figure 11).

Bradcovick et al. disclose a detector transport member **30**, which spans an arc of at least 180° about the examination axis. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Bradcovick et al. would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 67, Bradcovich et al. disclose that the base **10** and the support assembly **20** are substantially arcuate.

With regards to claim 68, Bradcovich et al. disclose that the detector transport member **30** is moveable along an arc defined by the base **10** (column 7, lines 19-24).

With regards to claim 69, Bradcovich et al. disclose that the detector transport member includes a rack **222** (Figure 9) and the base includes complementary pinion

224, wherein the detector transport member **30** can be rotated about an axis of rotation by controlling the rotation of electrical motor **230** coupled to the pinion **224** through gearbox **228** and shaft **226** to move the detector between a plurality of imaging positions (column 5, lines 58-64).

With regards to claim 70, Bradcovich et al. illustrate the motor **230** adjacent the support assembly **20** (Figure 9). Bradcovich et al. do not specifically disclose that the motor is in the base, although Bradcovich et al. already disclose another **94** for rotation of the detector about another axis enclosed within the base **10** (Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the motor integral with the base, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

With regards to claim 71, Bradcovich et al. are silent with regards to the location of an electrical source for powering the electrical motor, the necessity for an electrical power source for the motor being inherent in the use of such a motor. However, it would have been obvious for one of ordinary skill in the art at the time the invention was made to position the motor power source as close to the motor as possible and thus in the base with the motor so as to minimize the length of power cables, since longer power cables would result in increased resistance and power usage as well as contributing to electrical noise within the system.

With regards to claim 72, Bradcovich et al. illustrate that the toothed rack **222** is coupled to the outer periphery of the detector transport member **20** (Figure 9).

With regards to claims 73 and 74, Bradcovich et al. teach that the detector transport member **30** includes an edge, in the form of steel rail **134** (Figure 4; column 4, lines 26-47), and the base includes a support assembly **20** with a groove (column 5, lines 17-20), wherein supporting the detector transport member **30** comprises engaging the edge such that the groove and edge support the detector transport member, thus opposing a moment load on the edge from the detector transport member weight.

With regards to claim 75, Bradcovich et al. teach that the support assembly comprises a sliding member, in the form of a coated groove to engage the rail **134** (column 5, lines 15-29). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide several sliding segments instead of a single unitary sliding segment, since it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the art. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

With regards to claim 76, Bradcovich et al. teach that a plurality of rollers, in the form of cam followers **136**, can be used to engage the edge **134** (Figure 4).

With regards to claim 77, Bradcovich et al. teach that the support assembly **20** supports the detector transport member **30**, thus supporting a moment load from a weight of the detector transport member.

With regards to claim 81, Bradcovich et al. teach the use of brake mechanism to prevent the motion of the detector transport member (column 4, lines 58-64).

With regards to claims 83 and 84, Bradcovich et al. teach the detectors **50** are coupled to the detector transport member **30** through ball bearings **44** which allow the detectors to pivot or tilt about with respect to the axis of rotation (column 3, lines 54-61). Bradcovich et al. do not specifically teach that the detectors are fixedly coupled to the detector transport member (i.e. the detectors are not capable of independent motion with respect to the detector transport member). It would have been obvious to one having ordinary skill in the art at the time the invention was made to fixedly couple the detectors to the detector transport member, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

With regards to claim 91, Bradcovich et al. disclose a medical imaging apparatus comprising:

A generally arcuate support assembly **20**;

A detector transport member **30** coupled to the support assembly **20**, the detector transport member **30** spanning an arc of at least 180° about a rotation axis (Figure 11);

Two detectors **50**, **50'** coupled to said detector transport member **30** (Figure 11).

Bradcovick et al. disclose a detector transport member **30**, which spans an arc of at least 180° about the examination axis. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide

any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Bradcovick et al. would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Bradcovich et al. teach the detectors **50** are coupled to the detector transport member **30** through ball bearings **44** which allow the detectors to pivot or tilt about with respect to the axis of rotation (column 3, lines 54-61). Bradcovich et al. do not specifically teach that the detectors are fixedly coupled to the detector transport member (i.e. the detectors are not capable of independent motion with respect to the detector transport member). It would have been obvious to one having ordinary skill in the art at the time the invention was made to fixedly couple the detectors to the detector transport member, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

With regards to claim 92, Bradcovich et al. disclose that the support assembly **20** is generally C-shaped (Figures 1 and 4).

With regards to claim 93, Bradcovich et al. disclose that the detector transport member **30** is generally arcuate shaped.

With regards to claim 94, Bradcovich et al. disclose that the detector transport member includes a rack **222** (Figure 9) and the base includes complementary pinion **224**, wherein the detector transport member **30** can be rotated about an axis of rotation by controlling the rotation of electrical motor **230** coupled to the pinion **224** through gearbox **228** and shaft **226** to move the detector between a plurality of imaging positions (column 5, lines 58-64), the motor in combination with the rack and pinion system thus comprising a power transmission member.

With regards to claim 95, Bradcovich et al. illustrate the motor **230** adjacent the support assembly **20** (Figure 9). Bradcovich et al. do not specifically disclose that the motor is in the base, although Bradcovich et al. already disclose another **94** for rotation of the detector about another axis enclosed within the base **10** (Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the motor integral with the base, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

With regards to claim 96, Bradcovich et al. are silent with regards to the location of an electrical source for powering the electrical motor, the necessity for an electrical power source for the motor being inherent in the use of such a motor. However, it would have been obvious for one of ordinary skill in the art at the time the invention was

made to position the motor power source as close to the motor as possible and thus in the base with the motor so as to minimize the length of power cables, since longer power cables would result in increased resistance and power usage as well as contributing to electrical noise within the system.

19. Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradcovick et al., as applied to claim 81 above, and further in view of Ashburn (US Patent # 6,147,352).

Bradcovick et al. discloses all the limitations of parent claim 81, as discussed above. However, Bradcovick et al. do not specifically disclose that the detector transport member is substantially stationary while the detectors are receiving gamma rays.

Ashburn teaches that in SPECT imaging it is common to use a step and shoot method, wherein during imaging the detectors are held in a single position for imaging and then rotated to the next imaging location (column 2, lines 3-8).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to maintain the detector transport member in a stationary position during imaging, since Ashburn teaches that such methods are well known in the art and that remaining stationary during imaging would help prevent image distortion.

20. Claims 46-58, 62, 63, 78, 79, and 87-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradcovick et al., as applied to claims 66 and 84 above, and further in view of Maor (US Patent # 6,160,258).

With regards to claim 46, Bradcovick et al. disclose a method of imaging a patient, the method comprising the steps of:

Coupling a pair of nuclear medicine detectors **50**, **50'** (Figure 11) to a detector transport member **30** such that the detectors move with the detector transport member **30**, the detector transport member spanning an arc of about 180° about the axis of rotation;

Supporting the detector transport member **30** with a base **10** having a support assembly **20** for receiving the detector transport member **30**; and,

Bradcovick et al. allow for the detector transport member **30** to be rotated to a plurality of imaging positions, but do not specifically disclose doing so using the detector transport member during imaging of a patient. Instead, Bradcovick et al. disclose that the detectors can be rotated into any position about a patient in order to customize the detection to the patient (see abstract). Further, Bradcovick et al. use rotation of the entire detector transport member around the X-X axis for tomographic imaging.

Maor teaches a nuclear medicine imaging method wherein a nuclear medicine detector **26** can be rotated around a patient **14** through an arc of 180° in order to attain SPECT images of the heart (column 1, lines 25-31), wherein the axis of rotation of the detectors is parallel to the axis of the patient. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to modify

Bradcovick et al. such that the detectors are rotated 180° around the patient to attain a plurality of images in order to perform cardiac SPECT studies, as taught by Maor.

Bradcovick et al. disclose a detector transport member **30**, which spans an arc of at least 180° about the examination axis. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Bradcovick et al. would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claims 47-49, Bradcovich et al. disclose two parallel oriented detectors **50**, **50'** (Figure 11) coupled to the detector transport member **30**. Bradcovich et al. do not disclose that the detectors a perpendicularly oriented with proximate edges such that the normal centerline of the face of the detectors is orthogonal to the examination axis.

Maor teaches that it is advantageous in SPECT imaging to use dual detector with two detector heads oriented at 90° angles with respect to each other so as to allow the capture of 180° of data with only 90° of rotation (column 3, lines 33-35). Maor further

teaches that such a configuration enables shorter acquisition times compared with a single detector (column 3, lines 35-37).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use two orthogonal detectors instead of a single detector so as to take advantage of shorter image acquisition times and decreased rotation requirements in SPECT imaging, as taught by Maor.

With regards to claim 50, Bradcovich et al. teaches that the patient on bed **70** is positioned through the gap in the detector transport member (Figure 1). Maor teaches that the patient is aligned with the rotation axis (i.e. the examination axis) to enable 180° SPECT imaging of the heart (column 1, lines 25-31; Figure 2).

With regards to claim 51, Bradcovich et al. teach that the detector transport member **30** includes an edge, in the form of steel rail **134** (Figure 4; column 4, lines 26-47), and the base includes a support assembly **20** with a groove (column 5, lines 17-20), wherein supporting the detector transport member **30** comprises engaging the edge such that the groove and edge support the detector transport member, thus opposing a moment load on the edge from the detector transport member weight.

With regards to claim 52, Bradcovich et al. disclose that the detector transport member has an edge and the base has a groove, as discussed above with respect to claim 51. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the base with the edge and the detector transport member with the groove, since it has been held that a mere reversal of the essential

working parts of a device involves only routine skill in the art. In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955).

With regards to claim 53, Bradcovich et al. disclose that the detector transport member includes a rack **222** (Figure 9) and the base includes complementary pinion **224**, wherein the detector transport member **30** can be rotated about an axis of rotation by controlling the rotation of electrical motor **230** coupled to the pinion **224** through gearbox **228** and shaft **226** to move the detector between a plurality of imaging positions (column 5, lines 58-64).

With regards to claim 54, Bradcovich et al. illustrate the motor **230** adjacent the support assembly **20** (Figure 9). Bradcovich et al. do not specifically disclose that the motor is in the base, although Bradcovich et al. already disclose another **94** for rotation of the detector about another axis enclosed within the base **10** (Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the motor integral with the base, since it has been held that making separate structures into a single piece without producing any new and unexpected results involves only routine skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

With regards to claims 55-57, it is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by the combination of Bradcovich et al. and Maor, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose

that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

With regards to claim 58, Bradcovich et al. disclose receiving gamma ray emissions (column 1, lines 18-23).

With regards to claim 62, Bradcovich et al. disclose a method for medical imaging comprising:

Translating a detector transport member **30** along an arcuate path about a rotation axis, the detector transport member **30** spanning at least 180° about the rotation axis, and two nuclear medicine detectors **50**, **50'** coupled to the detector transport member **30** (Figure 11);

Supporting the detector transport member **30** with an arcuate base **10** having an arcuate support assembly **20** for receiving the detector transport member **30**, the base **10** remaining stationary with respect to the rotation axis (column 3, lines 26-30).

Bradcovick et al. allow for the detector transport member **30** to be rotated to a plurality of imaging positions, but do not specifically disclose doing so using the detector transport member during imaging of a patient. Instead, Bradcovick et al. disclose that

the detectors can be rotated into any position about a patient in order to customize the detection to the patient (see abstract). Further, Bradcovick et al. use rotation of the entire detector transport member around the X-X axis for tomographic imaging.

Maor teaches a nuclear medicine imaging method wherein a nuclear medicine detector **26** can be rotated around a patient **14** through an arc of 180° in order to attain SPECT images of the heart (column 1, lines 25-31), wherein the axis of rotation of the detectors is parallel to the axis of the patient. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to modify Bradcovick et al. such that the detectors are rotated 180° around the patient to attain a plurality of images in order to perform cardiac SPECT studies, as taught by Maor.

Bradcovick et al. disclose a detector transport member **30**, which spans an arc of at least 180° about the examination axis. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Bradcovick et al. would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 63, Bradcovich et al. disclose two parallel oriented detectors **50**, **50'** (Figure 11) coupled to the detector transport member **30**. Bradcovich et al. do not disclose that the detectors are perpendicularly oriented with proximate edges such that the normal centerline of the face of the detectors is orthogonal to the examination axis.

Maor teaches that it is advantageous in SPECT imaging to use dual detector with two detector heads oriented at 90° angles with respect to each other so as to allow the capture of 180° of data with only 90° of rotation (column 3, lines 33-35). Maor further teaches that such a configuration enables shorter acquisition times compared with a single detector (column 3, lines 35-37).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use two orthogonal detectors instead of a single detector so as to take advantage of shorter image acquisition times and decreased rotation requirements in SPECT imaging, as taught by Maor.

With regards to claims 78 and 79, Bradcovich et al. disclose two parallel oriented detectors **50**, **50'** (Figure 11) coupled to the detector transport member **30**. Bradcovich et al. do not disclose that the detectors are perpendicularly oriented with proximate edges such that the normal centerline of the face of the detectors is orthogonal to the examination axis.

Maor teaches that it is advantageous in SPECT imaging to use dual detector with two detector heads oriented at 90° angles with respect to each other so as to allow the capture of 180° of data with only 90° of rotation (column 3, lines 33-35). Maor further

teaches that such a configuration enables shorter acquisition times compared with a single detector (column 3, lines 35-37).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use two orthogonal detectors instead of a single detector so as to take advantage of shorter image acquisition times and decreased rotation requirements in SPECT imaging, as taught by Maor.

Further, it is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by the combination of Bradcovich et al. and Maor, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

With regards to claims 87 and 89, Bradcovich et al. teach that the detectors receive gamma ray emissions from a patient at an imaging position (column 1, lines 18-23; column 2, lines 57-60).

With regards to claim 88, Bradcovich et al. teach all the limitations of parent claim 84, as discussed above. Bradcovich et al. disclose two parallel oriented detectors **50, 50'** (Figure 11) coupled to the detector transport member **30**. Bradcovich et al. do not disclose that the detectors are perpendicularly oriented with proximate edges such that the normal centerline of the face of the detectors is orthogonal to the examination axis.

Maor teaches that it is advantageous in SPECT imaging to use dual detector with two detector heads oriented at 90° angles with respect to each other so as to allow the capture of 180° of data with only 90° of rotation (column 3, lines 33-35). Maor further teaches that such a configuration enables shorter acquisition times compared with a single detector (column 3, lines 35-37).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use two orthogonal detectors instead of a single detector so as to take advantage of shorter image acquisition times and decreased rotation requirements in SPECT imaging, as taught by Maor.

With respect to claim 90, Bradcovich et al. illustrate that the two detectors are at different locations on the detector transport member (Figure 11).

21. Claims 59-61, 64, 65, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradcovich et al. (US Patent # 4,426,578) in view of Maor (US Patent # 6,160,258) and Ashburn (US Patent # 6,147,352).

With regards to claim 59, Bradcovich et al. disclose a method of imaging a patient, the method comprising the steps of:

Aligning a patient with an examination axis by moving the patient through a gap in an arcuate detector transport member **30** (column 7, lines 8-18);

Coupling a pair of nuclear medicine detectors **50**, **50'** (Figure 11) together using detector transport member **30;**

Rotating the pair of detectors about an examination axis, the pair of detectors rotating with the detector transport member, the detector transport member spanning an arc of about 180° about the examination axis;

Supporting the detector transport member with a base **10** having a support assembly **20** for receiving the detector transport member **30**, the base remaining stationary with respect to the examination axis (column 3, lines 26-30).

Bradcovick et al. disclose a detector transport member **30**, which spans an arc of at least 180° about the examination axis. However, applicant only requires that the detector transport member span an arc of less than about 180°, but does not provide any guidance as to what qualifies as less than about 180°. Given the broadest reasonable interpretation of the terminology, about 180° can include arc lengths slightly greater than 180°, such that the detector transport member proposed by Bradcovick et al. would satisfy the claim limitation.

Further, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to make the detector transport member span an arc length less than 180°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Bradcovich et al. do not specifically disclose that the pair of detectors are oriented substantially perpendicular to each other. Bradcovich et al. disclose two parallel oriented detectors **50**, **50'** (Figure 11) coupled to the detector transport member **30**. Bradcovich et al. do not disclose that the detectors are perpendicularly oriented with proximate edges such that the normal centerline of the face of the detectors is orthogonal to the examination axis. Maor teaches that it is advantageous in SPECT imaging to use dual detector with two detector heads oriented at 90° angles with respect to each other so as to allow the capture of 180° of data with only 90° of rotation (column 3, lines 33-35). Maor further teaches that such a configuration enables shorter acquisition times compared with a single detector (column 3, lines 35-37). Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use two orthogonal detectors instead of a single detector so as to take advantage of shorter image acquisition times and decreased rotation requirements in SPECT imaging, as taught by Maor.

Bradcovich et al. are further silent with regards to rotating the detectors through an arc spanning less than 180°. It is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by the combination of Bradcovich et al. and Maor, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a

dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

Bradcovich et al. are further silent with regards to the method of rotation for imaging, i.e. "step and shoot" or continuous. However, Ashburn teaches that it is well known in the art to use either stepped or continuous rotation in SPECT imaging (column 2, lines 3-8). Ashburn further teaches that continuous rotation is desirable for reducing acquisition time (column 2, lines 8-10). Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to continuously rotate the detector transport member, so as to reduce image acquisition time, as taught by Ashburn.

With regards to claim 60, the combination of Maor with Bradcovich et al. teaches that the edge of the detecting face of the first detector is proximate the edge of the detecting face of the second detector (Figures 3A, 3B).

With regards to claim 61, Bradcovich et al. disclose that the base **10** is arcuate with an arcuate support assembly **20** (Figure 1).

With regards to claim 64, the combination of Bradcovich et al. and Maor discloses all the limitations of parent claim 62, as discussed above. However, Bradcovich et al. are silent with regards to the method of rotation for imaging, i.e. "step and shoot" or continuous. However, Ashburn teaches that it is well known in the art to

use either stepped or continuous rotation in SPECT imaging (column 2, lines 3-8). Ashburn further teaches that continuous rotation is desirable for reducing acquisition time (column 2, lines 8-10). Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to continuously rotate the detector transport member, so as to reduce image acquisition time, as taught by Ashburn.

With regards to claim 65, Bradcovich et al. are further silent with regards to rotating the detectors through an arc spanning less than 180°. It is known in the art that SPECT images using two detectors perpendicularly oriented, as disclosed by the combination of Bradcovich et al. and Maor, can be attained using detector rotations less than 180° for different imaging applications. Maor teaches that in SPECT cardiac studies, only 180° of rotation is necessary using a single detector (column 1, lines 25-31). For example, Maor disclose that modern reconstruction techniques are capable of handling single detector rotations less than 180° to be used (column 1, lines 57-62). Maor further disclose that by using a dual detector, 180° data can be attained with only 90° of rotation (column 3, lines 33-38), thus providing image data in a shorter acquisition time. Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide a rotation of 90° to attain 180° of data so as to enable shorter acquisition times and allow different imaging applications, as taught by Maor.

With regards to claim 80, the combination of Bradcovich et al. and Maor disclose all the limitations of parent claim 78 as discussed above. However, Bradcovich et al.

are silent with regards to the detector transport member configured to rotate less than 90°. Ashburn teaches that in SPECT imaging, rotation of less than 90° may be used to enable imaging of a patient the is not fully upright (column 6, lines 30-33). Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to configure the detector transport member to rotate less than 90°, so as to enable SPECT imaging of a patient that is not fully upright, as taught by Ashburn.

22. Claims 85 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradcovich et al., as applied to claim 66 above, and further in view of DeVito et al. (US Patent # 6,242,743).

With regards to claims 85 and 86, Bradcovich et al. disclose all the limitations of parent claim 66, as discussed above, but is silent with regards to the detectors comprising pixilated CZT.

DeVito et al. teach the use of pixilated CZT detectors in SPECT imaging. Specifically, DeVito et al. teach that pixilated CZT detectors are preferred because they combine the desirable traits of compact size, room-temperature operability, position sensitivity, good energy resolution, and good stopping power (column 6, lines 6-18).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use pixilated CZT detectors for the nuclear medicine detectors, so as to take advantage of their desirable performance characteristics, as taught by DeVito et al.

Double Patenting

23. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

24. Claims 46-50, 53-58, 62-71, 78-80, 85, and 88 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3-7, 11-14, 16-19, 21-32 of copending Application No. 11/189,453. Although the conflicting claims are not identical, they are not patentably distinct from each other because.

Claims of the present application are substantially identical to the claims of copending application 11/189453 except the independent claims 1, 17, and 29 recite an arcuate transport element and a rolling member and at least one detector coupled to the detector transport member. Independent claims 66, 46, and 62 correspond with the

independent claims of 1, 17, and 29 of the conflicting application, respectively. However, applicant has recited separate limitations of an arcuate transport element and a rolling member as well as at least one detector in the conflicting application. The arcuate transport element and rolling member of the conflicting application would be analogous to the support assembly of the present claims. Further, the limitation of the at least one detector encompasses the range of at least two detectors of the present application. As such, these applications would not be patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gregerson et al. (US Patent # 6,940,941) disclose a breakable gantry X-ray CT apparatus.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday-Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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